AATA 104B: ULTRASONIC PHASED ARRAY LABORATORY

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	1
Hours:	40 laboratory per quarter (40 total per quarter)
Prerequisite:	This course is limited to students admitted to the Nondestructive Testing Technician Apprenticeship Program.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Pass/No Pass Only
Repeatability:	Not Repeatable

Description

Ultrasonic phased array testing laboratory, in which students will receive hands-on training using plates and pipes with embedded flaws. Students will be able to perform tests, analyze results, and categorize flaws.

Course Objectives

The student will be able to:

a. Navigate the menus and set up an Omniscan machine
b. Upload software programs to the Omniscan machine
c. Calibrate the Omniscan machine
d. Perform element check
e. Use PAUT in lieu of RT when applicable
f. Understand the limitations of PAUT

Course Content

a. Omniscan menus and setups, navigation
    i. Menus, submenus
    ii. UT settings, focal laws
    iii. Straight beam and angle beam module PA5: Omniscan calibration
    iv. Sound velocity
    v. Wedge delay
    vi. Sensitivity
    vii. TCG
b. OmniPC - analysis software, loading data
    i. Analysis tools
c. Phasor menus and setup
    i. Menus
    ii. Setting
    iii. Setting sectorial scan
d. Phasor calibration
    i. Sound velocity
    ii. Wedge delay
    iii. Sensitivity
    iv. TCG
e. Element check
f. Straight beam inspection
    i. Probe selection
    ii. Focal law
    iii. Sweep angle
g. Weld inspection
    i. Setup
    ii. Probe/part
    iii. Scanning weld samples
h. Encoded scans
    i. Setup of scanner
    ii. Encoder calibration
    iii. Scanning weld samples
i. PAUT in lieu of RT
    i. ASME Section V, Article 4, Appendix VIII and IX
    ii. ASME Section VIII, Section 7.5.5 (previously Code Case 2235-09)
    iii. B31.3 Code Case 181-2, Use of Alternate Acceptance Criteria
    iv. Examples of accept/reject
j. Special applications; inspection of stainless steel, duplex steels and A 625 welds using refracted L-waves
    i. Generating of refracted L-waves
    ii. Limitation of refracted L-waves
    iii. Inspection of welds in stainless steels and duplex steel
    iv. Inspection of A625 closure welds
    v. Inspection of A625 clad

Lab Content

Phased array UT inspections to be completed on reference samples to find, size, locate, and decide rather or not anomalies are accepted or rejected to industry standards.

Special Facilities and/or Equipment

1. Omniscan MX 32:128, transducers, test pieces, couplant.
2. When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Results of practical exam
Results of written test

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Discussion
Video
Demonstration
Hands-on training

Representative Text(s) and Other Materials

Handouts provided by instructor.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

Reading of in-class handouts.

Discipline(s)

Industrial Maintenance